

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 4, 7, 9, 12, 16, and 20, and cancel claims 2, 10-11, 13-14, and 24-27, as set forth in the listing of claims that follows:

1. (Currently Amended) A method for operating a hybrid brake apparatus having a front hydraulically actuated brake circuit including a master cylinder for providing pressurized fluid to the front brake circuit in response to an input applied to a brake pedal connected to the hybrid braking apparatus ~~applied to the master cylinder~~ to apply a frictional front braking force, and a rear electrically actuated brake circuit actuated by a control signal from a controller ~~controllable in response to the input applied to the master cylinder to provide~~ to produce a frictional rear braking force, the method comprising:

providing a pedal travel sensor for detecting the input to the brake pedal, said pedal travel sensor operatively connected to the controller, and generating a control signal by said controller in response to input detected by the pedal travel sensor;

monitoring the pressurized fluid within the front brake circuit to determine performance of the front brake circuit, and comparing the monitored performance to parameters indicative of normal operation of the front brake circuit in response to the input;

when the monitored performance indicates normal operation of the front brake circuit, providing the control signal to control ~~controlling~~ the rear brake circuit in accordance with a first predetermined relationship between the input and rear braking

force during normal operation of the front brake circuit; and
~~detecting a degradation of front braking force; and~~
when the monitored performance indicates degradation of the front brake
circuit, providing the control signal to control ~~controlling~~ the rear brake circuit in
accordance with a second predetermined relationship between the input and the rear
braking force, to thereby compensate for the degradation of front braking force.

2. (Cancelled)

3. (Original) The method of claim 1, wherein the second predetermined
relationship increases braking force applied by the rear brake circuit in response to the
input.

4. (Currently Amended) The method of claim 1 wherein ~~the hybrid brake~~
~~apparatus further includes a brake pedal operatively attached the master cylinder for~~
~~providing the input through application of a pedal force and pedal travel to the brake~~
~~pedal, and~~ the second predetermined relationship between the input and rear braking
force includes compensation for changes in pedal force and pedal travel resulting from
the degradation of front braking force.

5. (Original) The method of claim 4 further comprising providing a pedal feel emulator operatively attached to the master cylinder to compensate for changes in one or both of pedal force and pedal feel resulting from the degradation of front braking force.

6. (Original) The method of claim 5 further comprising providing pedal feel emulation in the pedal feel emulator with a rubber compression spring.

7. (Currently Amended) The method of claim 1 wherein the master cylinder includes a movable piston thereof for generating a hydraulic pressure in the front brake circuit in response to the input, and the method further comprises, monitoring ~~both the input and the~~ front braking force with ~~a travel sensor and~~ a hydraulic pressure sensor operatively attached to the master cylinder.

8. (Original) The method of claim 7 wherein the brake apparatus is adapted for installation in a vehicle having at least one front wheel controllable by the front braking force, and at least one rear wheel controllable by the rear braking force, and the method further comprises, monitoring front braking force with a wheel speed sensor operatively attached for sensing the rotational speed of the at least one front wheel.

9. (Currently Amended) The method of claim 7 wherein the front brake circuit includes a first and a second hydraulic circuit, and the master cylinder includes a first movable piston operatively connected for supplying pressurized fluid to the first brake circuit in response to the input and a second movable piston operatively connected for supplying pressurized fluid to the second hydraulic circuit in response to the input, and the method further comprises, providing front braking pressure with the first hydraulic circuit and operatively connecting the pressure sensor to ~~the only~~ the second hydraulic circuit for monitoring pressure generated by the second piston of the master cylinder.

10-11. (Cancelled)

12. (Currently Amended) A hybrid brake apparatus comprising:

a front hydraulically actuated brake circuit including a master cylinder for providing pressurized fluid to the front brake circuit to apply a frictional front braking force and a brake pedal for applying in response to an input applied to the master cylinder to apply a frictional front braking force;

a pedal travel sensor for detecting the input by the brake pedal;

means for monitoring the pressurized fluid within the front brake circuit to determine performance of the front brake circuit;

a rear electrically actuated brake circuit operable ~~controllable~~ in response to the input applied to the brake pedal ~~master cylinder~~ to provide a frictional rear braking force; and

a controller for generating a control signal for actuating the rear brake circuit in response to input to the brake pedal detected by the pedal travel sensor, said controller comparing the pressurized fluid to parameters indicative of normal operation of the front brake circuit in response to the input and providing the control signal for controlling the rear brake circuit in accordance with a first predetermined relationship between the input and rear braking force during when the monitored performance is indicative of normal operation of the front brake circuit, detecting a degradation of front braking force, and for controlling the rear brake circuit in accordance with a second predetermined relationship between the input and the rear braking force, ~~to thereby compensate for the~~ when the monitored performance is indicative of degradation of the front braking force.

13-14. (Cancelled)

15. (Original) The hybrid brake apparatus of claim 12, wherein the second predetermined relationship increases braking force applied by the rear brake circuit in response to the input.

16. (Currently Amended) The brake apparatus of claim 12 wherein ~~the hybrid brake apparatus further includes a brake pedal operatively attached the master cylinder for providing the input through application of a pedal force and pedal travel to the brake pedal, and~~ the second predetermined relationship between the input and rear braking force includes compensation for changes in pedal force and pedal travel resulting from the degradation of front braking force.

17. (Original) The hybrid brake apparatus of claim 16 further comprising a pedal feel emulator operatively attached to the master cylinder to compensate for changes in either or both of pedal force and pedal feel, resulting from the degradation of front braking force.

18. (Original) The hybrid brake apparatus of claim 17 wherein the pedal feel emulator includes a rubber compression spring.

19. (Original) The hybrid brake apparatus of claim 18 wherein the pedal feel

emulator is disposed within the master cylinder.

20. (Currently Amended) The hybrid brake apparatus of claim 12 wherein the master cylinder includes a movable piston thereof for generating a hydraulic pressure in the front brake circuit in response to the input, and ~~the brake apparatus further comprises, a travel sensor and a hydraulic pressure sensor operatively attached to the master cylinder~~ for monitoring both the input and front braking force.

21. (Original) The hybrid brake apparatus of claim 20 wherein the brake apparatus is adapted for installation in a vehicle having at least one front wheel controllable by the front braking force, and at least one rear wheel controllable by the rear braking force, and the brake apparatus further comprises a wheel speed sensor operatively attached for monitoring front braking force by sensing the rotational speed of the at least one front wheel.

22. (Original) The hybrid brake apparatus of claim 20 wherein the front brake circuit includes a first and a second hydraulic circuit, and the master cylinder includes a first and a second movable piston, the first piston operatively connected for providing front braking force by supplying pressurized fluid to the first hydraulic circuit in response to the input, the second movable piston operatively connected for supplying pressurized fluid to the second hydraulic circuit in response to the input, and the pressure sensor is operatively connected to only the second hydraulic circuit for monitoring pressure generated by the second piston of the master cylinder.

23. (Original) The hybrid brake apparatus of claim 20 wherein the front brake circuit includes a first and a second hydraulic circuit, and the master cylinder includes a first and a second movable piston, the first piston operatively connected for providing front braking by supplying pressurized fluid to the first hydraulic circuit in response to the input, the second movable piston operatively connected for providing front braking force by supplying pressurized fluid to the second hydraulic circuit in response to the input, and the pressure sensor is operatively connected to only the first hydraulic circuit for monitoring pressure generated by the first piston of the master cylinder.

24-27. (Cancelled)



28. (Withdrawn) A pedal feel emulator for a hydraulic brake apparatus, the pedal feel emulator comprising:

a housing defining a cylinder bore;

a piston movable within the cylinder bore; and

a rubber compression spring operatively disposed in the cylinder bore between the piston and the housing for resisting movement of the piston within the cylinder bore.

29. (Withdrawn) The pedal feel emulator of claim 28 wherein the housing is a master cylinder housing, the cylinder bore is a master cylinder bore, the piston is a master cylinder piston for supplying pressurized fluid to a hydraulic brake system.